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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,979	12/31/2001	Toshio Miyamoto		6075

7590

04/25/2003

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EXAMINER

CHAMBLISS, ALONZO

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,979

Applicant(s)

MIYAMOTO ET AL.

Examiner

Alonzo Chambliss

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) 1-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed on 12/31/01 has been fully considered and made of record in Paper No. 2. Therefore, claims 1-24 have been canceled and claims 25-48 are pending in the instant application.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/499,618, filed on 2/7/00.

Information Disclosure Statement

3. The examiner was not able to locate Japan reference 7-86492 at the time of this non-final rejection. Therefore, the above reference has not been considered by the examiner. It would be appreciated if the applicant would mail a copy of the reference so that the examiner can consider the reference. Otherwise, the information disclosure statement (IDS) submitted on 12/31/01 was filed before the mailing date of the non-final rejection on 4/21/03. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character " 2 " has been used to designate both leads and printed circuit board. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: S16 in Fig. 8. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

6. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: " METHOD OF MANUFACTURING A HIGH DENSITY MEMORY-MODULE ".
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Claim Objections

7. Claim 43 is objected to because of the following informalities: the word " device " on line 15 is misspelled. It is suggest applicant change " devices " to -- device --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 25-36 and 43-48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
10. In claims 25 and 31, the phrase " wiring portions for expanding the pitch of the protruded terminals to be wider than the pitch of the bonding electrodes " is vague and indefinite since it is not clear from the claim how the wirings portions expand the pitch of the protruding terminals. Furthermore, it is not clear the claim how expanding creates protruding terminals that are wider than the pitch of the bonding electrodes.
11. Claims 25-36 recite the limitation " the bonding electrodes " in lines 6 and 7, respectively. There is insufficient antecedent basis for this limitation in the claim.
12. Claim 43 recites the limitation " a module board " in line 13. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 25-48, insofar as definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki (U.S. 6,342,726) in view of Carpenter (U.S. 5,541,448)

With the respect Claims 25, 31, 37, and 43 Miyazaki discloses a memory module 24 comprising the steps of providing a plurality of first semiconductor devices 13 (i.e. chip size package) each having protruded terminals (i.e. solder attachments) as external terminals. A second semiconductor device 14 having outer leads which are external terminals electrically connected to bonding electrodes of a semiconductor chip arranged in the second semiconductor device. The first semiconductor devices 13 and the second

semiconductor device 14 are arranged on a module board 15. It is inherent that land pads are present on the module board for electrical connection between the first and second devices. One skilled in the art would readily recognize to simultaneously soldering the first semiconductor devices and the second semiconductor device to mount them on the module board after the step of arranging the first semiconductor devices and the second semiconductor device on the module board after the step of arranging the first and second devices, since simultaneously soldering a plurality of devices would save time during manufacturing which would reduce the cost of the memory module. Also, one skilled in the art would readily recognize solder reflowing to make electrical connection between the first and second devices and the module board after attaching the first and second devices to the board, since reflowing allows the solder to melt to form a firm electrical bond between the land pad of the board and the external terminals of the first and second devices. Therefore, it would have been obvious to incorporate simultaneously solder the first and second devices after arranging them on the module board with the process of Miyazaki, since simultaneously soldering a plurality of devices would save time during manufacturing which would reduce the cost of the memory module. Miyazaki discloses wiring portions 10,11 for expanding the pitch of the protruded terminals 5 to be wider than the pitch of the bonding electrodes 7 of semiconductor chip 1 in the first semiconductor devices 13. (see Fig. 1).

With respect to Claim 26, 32, 38, and 44, Miyazaki discloses wherein an number of the first semiconductor devices 13 is larger than that of the second semiconductor device 14 on the module board 15 (see Fig. 4).

With respect to Claims 27-30, 33-36, 39-42, and 45-48, Miyazaki discloses wherein each of the first semiconductor devices is a DRAM device, which is a nonvolatile read-only memory device (see col. 12 lines 15-18). Furthermore, it is well known in the semiconductor industry to interchange DRAMs devices with EEPROM devices as evidence by Carpenter (see col. 1 lines 17-24). Thus, it is inherent in DRAM and EEPROM device to have a write enable input terminal.

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

15. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

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AC/April 21, 2003

Alonzo Chambliss
Patent Examiner
Art Unit 2827